



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/707,208

11/26/2003

Viraj A. Patwardhan

NSCIP131X3

1207

22434

7590

04/06/2007

BEYER WEAVER LLP

P.O. BOX 70250

OAKLAND, CA 94612-0250

EXAMINER

TRINH, HOA B

ART UNIT

PAPER NUMBER

2814

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
--	-----------	---------------

3 MONTHS

04/06/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/707,208

Applicant(s)

PATWARDHAN ET AL.

Examiner

Vikki H. Trinh

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8-16, 21-30 and 32 is/are pending in the application.
- 4a) Of the above claim(s) 14-16, 22-24 and 28-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-13, 21, 25-27 and 32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/21/07 has been entered.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 8-13, 21, 25-27 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsman et al. (hereinafter Kinsman, US 2002/0027257, applicants cited).

Kinsman discloses a integrated circuit device (fig. 1f) , comprising a die (page 3, [0023]) having an active surface 14 (fig. 1f), a plurality of solder bumps 20/32 (fig.1f) formed on the active surface 14 of said die such that base junctions between the solder bumps 20/32 and their associated surfaces of formation define first wetting angles; and a single support coating 30 (fig.1f) formed on said active surface of said die wherein said support coating 30 has been fully cured (page 3, [0026], lines 21-30) prior to any reflow of any of said plurality of solder bumps 20/32 (fig. 1f), and the resulting mid-level wetting angles remain sufficiently high such that the mid-level junctions do not become the primary location for solder joint failure. Note that the solder bumps are spherical, page 4, [0029]) and that the bumps are formed from a single homogenous material (page 3, [0023]) However, Kinsman does not explicitly teach that the height of the support coating 30 is about 20-70 percent of the pre-reflow height of the solder bumps 20/32, and the resulting first wetting angles are at least approximately 40-50 degrees . Nevertheless, as to claims 8, 10-11, 13, 21, 25-27 and 32, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kinsman with specific ranges for the support coating's height relative to the bumps so as to result in the first wetting angles being at least 40-50 degrees, since it is a prima facie obvious to an artisan for optimization and experimentation to create specific ranges for the support coating height so as to obtain the resulting wetting angle of at least 40 degrees because applicant has not yet established any criticality for the specific angle.

*Normally, it is to be expected that a change in temperature, or in thickness, or in time, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art...such ranges are termed "critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the general conditions of a claim are disclosed in the*

Art Unit: 2814

*prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller 105 USPQ233, 255 (CCPA 19553).*

As to claim 9, the support coating 30 (fig. 1f) is formed from an epoxy based material (page 3, [0026], lines 25-29)

As to claim 12, the support coating 30 (fig. 1f) is applied over the active surface 14 and the underlying pads 12 (fig. 1f).

### ***Response to Arguments***

4. Applicant's arguments filed 02/12/2007 have been fully considered but they are not persuasive.

In the remarks, applicants argue that the rejection of claims 8-13, 21, 25-27, 32 under 35 USC 103(a) is traversed because Kinsman does not disclose the newly amended claims. On the contrary, Kinsman teaches that the bumps are spherical (fig 2 and page 4, [0029]). In addition, the bumps are made of a single material (note that Kinsman teaches the external solder 32 and the internal solder 20 are made of the same material for compatibility (page 3, [0023])).

Furthermore, applicants argue that the range for the height between the support coating relative to the solder bump and the wetting angle are distinguished over the cited art. The examiner disagrees because applicants have not show any unexpected result or advantage over the cited art's disclosure. Note that the courts have concluded that a change in dimension, degree, size, shape, etc. without special functional significance is not patentable. Research Corp. v. Nasco Industries, Inc., 501 F2d 358; 182 USPQ 449 (CA 7), cert. denied 184 USPQ 193; *USLW* 3359 (1974), *In re Rose*, 105 USPQ 137, and *In re Aller et al.*, 105 USPQ 233.

For the foregoing reason, the examiner maintains the rejection.


Art Unit: 2814

### Conclusion

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Vikki Trinh whose telephone number is (571) 272-1719. The Examiner can normally be reached from Monday-Friday, 9:00 AM - 5:30 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Wael Fahmy, can be reached at (571) 272-1705. The office fax number is 703-872-9306.

Any request for information regarding to the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Also, status information for published applications may be obtained from either Private PAIR or Public Pair. In addition, status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. If you have questions pertaining to the Private PAIR system, please contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

Vikki Trinh,  
Patent Examiner,  
AU 2814

  
SPE 2814